

DETAILED ACTION

Status of Claims

1. Claims 1-25, filed March 27th, 2008 are currently under examination, and independent claims 1 and 16 were amended by Applicants.

Status of Previous Objections

2. The instant application failed to include an Abstract on a separate page (MPEP 608.01(b) -Section C and 37 C.F.R. § 1.72) however a copy is forthcoming by fax and will be appended to the image file wrapper .

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Harry M. Levy on June 23rd, 2008.

The application has been amended as follows:

Abstract of the Invention

A method of separating metal particulates from a slurry of original constituents of liquid metal and metal particulates is disclosed. The metal and salt particulates are concentrated by removing at least some of the liquid metal, and then, liquid metal or a liquid of the original salt constituent or a mixture thereof is passed through the particulates at a temperature greater than the melting point of the original salt constituent to further concentrate the metal particulates. The metal particulates are

then separated from the remaining original constituents or a mixture of the salt constituent. Density differences between the liquid metal and the salt are also used to facilitate separation.

Status of Previous Rejections

3. The previous rejection of claims 1-25 under 35 U.S.C. 103(a) over **Armstrong** (US 5,958,106) in view of **Keller** (US 2,846,303) in the Office action dated December 27th, 2007 have been maintained.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Regarding claims 1 and 16, with respect to the amendments to claims 1 and 16, there are three main categories of changes that the Examiner notes:

1. Further limiting "liquid metal" to "liquid reducing metal"
2. Renaming "metal and salt particulates" as "reaction products"
3. "Maintaining the metal particulates below their sintering temperature"

With respect to the changes of type 1, the liquid metal used by Armstrong is a "liquid reducing metal" as explicitly stated, for example, at col. 7, lines 30-35. Furthermore, claim 1 of Armstrong discloses that Ti can be recovered using either liquid alkali or liquid alkaline earth metals -- both of which are known for their chemical reducing potential (col. 1, lines 33-36).

With respect to the amendments of type 2, the metal and salt particulates are the "reaction products" and it is clear that the titanium particles were separated from the sodium (metal) and sodium chloride (salt particulates) - (col. 7, lines 25-30).

With respect to the amendments of type 3, Armstrong was very specific in stating that all steps would be taken to avoid sintering the titanium particles together (col. 2, lines 43-47). Sintered was prevented by control of the titanium product's temperature using sufficient molten sodium metal or diluent gas (col. 5, lines 19-30).

Regarding dependent claims 2-15 and 17-25, these claims were no amended since the mailing of the previous Office Action on December 27th, 2007 and thus the claims stand rejected on the same grounds as detailed in the previous action.

Response to Applicant's Arguments:

4. Applicant's arguments have been fully considered but they are not persuasive.

Applicants assert that "the examiner's citation to various aspects of Armstrong et al '106 patent and the Keller et al '303 patent do not substantiate the examiner's conclusion that either reference alone or in combination teach the steps set forth in the claims".

Furthermore, Applicants assert that "the examiner has failed to make any of the four factual inquiries required."

In response, the Examiner has determined the scope and contents of the prior art, explained the differences between the prior art and the claims at issue, resolved the level of ordinary skill, and provided motivation as to why the references should be modified or combined as laid out in the previous Office Action mailed December 27th, 2007.

Applicants' first substantive line of reasoning (p. 3) begins with pointing out that "Armstrong is limited to recycling sodium to the inlet of the reaction chamber to make up

for sodium lost in the reaction" and that there is "no suggestion whatsoever...that the sodium should be recycled for any other purpose..."

In response, sodium is continually passed to the product separator as clearly shown in Figure 1. Furthermore, claim 1 allows for "passing the liquid reducing metal *or a liquid of the original salt constituent or a mixture thereof.*" As stated in the previous Office Action, reintroduction of decanted sodium is an obvious step in view of the use of sodium as a washing fluid to carry reactants and products in addition to controlling the temperature of the product as a heat exchange medium (col. 5, line 66 to col. 6, line 5).

Applicant asserts that Keller's teaching as to decantation at col. 4, line 75 to col. 5, line 9 does not relate to the subject matter of the present invention or nor provide the missing part of the invention.

In response, Keller is analogous art in that it is drawn to a method of producing metals by reducing a metal halide, forming titanium metal in particular (col. 1, lines 15-22) and recovering the crystalline titanium from a slurry of mixed molten salt (col. 2, lines 12-16). The excess sodium should be removed by a simple decantation operation as with excess by-product salt to yield a relatively concentrated mixture of titanium crystals of salt.

Lastly, Applicants argue that the two disclosures of Armstrong and Keller are so vastly different that the disclosures cannot be combined when considered as a whole.

In response, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the

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references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

-- Claims 1-25 are finally rejected
-- No claims are allowed

The rejections above rely on the references for all the teachings expressed in the texts of the references and/or one of ordinary skill in the metallurgical art would have reasonably understood or implied from the texts of the references. To emphasize certain aspects of the prior art, only specific portions of the texts have been pointed out. Each reference as a whole should be reviewed in responding to the rejection, since other sections of the same reference and/or various combinations of the cited references may be relied on in future rejections in view of amendments.

All recited limitations in the instant claims have been met by the rejections as set forth above. Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121; 37 C.F.R. Part §41.37 (c)(1)(v); MPEP §714.02; and MPEP §2411.01(B).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark L. Shevin whose telephone number is (571) 270-3588. The examiner can normally be reached on Monday - Thursday, 8:30 AM - 5:00 PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy M. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/Mark L. Shevin/

Examiner, Art Unit 1793

/Roy King/

Supervisory Patent Examiner, Art Unit 1793

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June 23rd, 2008